

HOCKEY STICK SHAFT

Technical Field

[0001] The present invention relates generally to a shaft for a hockey stick and,
5 more particularly, to a hockey stick shaft and hockey stick having improved handling characteristics.

Background Art

[0002] Many different hockey stick shafts have been made and used for street
10 hockey. Most frequently, wooden shafts have been offered which require that a plastic blade be screwed into or adhered to the distal end of the shaft, and that a rubber handle or butt end be attached to the proximal end of the shaft. Alternatively, hockey tape is often used to create a handle or butt end. In addition, a variety of plastic shafts have been offered, typically hollow, which require the addition of a blade and a
15 handle or butt end as described in connection with wooden shafts. One disadvantage of such shafts is that they do not allow street hockey players, often using their bare hands, or winter gloves or mittens, rather than protective hockey gloves, to firmly grasp and/or adequately control such shafts. Accordingly, many players add friction tape or other tape to such shafts, often in the locations where a player's hands are
20 positioned when shooting.

[0003] There is a need, therefore, for an improved hockey stick shaft which provides improved handling characteristics and allows street hockey players to securely grasp the shaft.

Disclosure of the Invention

[0004] With parenthetical reference to the corresponding parts, portions or surfaces
of the disclosed embodiment, merely for purposes of illustration and not by way of
limitation, the present invention provides an improved hockey stick shaft (10) and
hockey stick (15) which are particularly useful for street hockey. In one aspect of the
30 invention, the hockey stick shaft comprises an elongated main body portion (11) and
at least one rib portion (12A, 12B, 12C, 12D) coextruded with the main body portion,

wherein the rib portion(s) have a higher coefficient of friction than the coefficient of friction of the elongated main body portion, thereby providing a secure and comfortable grip.

[0005] In one aspect of the invention, the main body portion has a generally rectangular cross-section (*see*, Fig. 4). In another aspect of the invention, the main body portion is hollow. In yet another aspect of the invention, the main body portion comprises polypropylene, polyethylene, vinyl or acrylonitrile butadiene styrene, or other plastic materials. In another aspect of the invention, the rib portion(s) comprise(s) ethylene vinyl acetate, sanoprene or low-density polyethylene, or other plastic materials.

[0006] Another aspect of the invention includes a hockey stick blade (14) fastened to the distal end of the main body portion of the shaft. In yet another aspect, the main body portion has an exterior surface and a longitudinal axis, and the rib portion(s) are coextruded on the exterior surface of the main body portion generally parallel to the longitudinal axis of the main body portion. Another aspect of the invention is a hockey stick (15) comprising a hockey stick shaft having an elongated main body portion (11) and at least one rib portion (12A, 12B, 12C, 12D) coextruded with the main body portion, wherein the rib portion(s) have a higher coefficient of friction than the coefficient of friction of the main body portion. In other aspects, the main body portion (11) may be extruded independently of the rib portion(s), and the rib portion(s) may be subsequently extruded on the main body portion.

[0007] The general object of the invention is to provide an improved hockey stick shaft with improved handling capabilities. Another object is to provide a shaft having ribs with a relatively low coefficient of friction. Another object is to provide a hockey stick shaft wherein one or more ribs are coextruded on the surface of the main body portion of the hockey stick shaft.

[0008] Another object is to avoid the expense and inconvenience of using tape to create a gripable area on a hockey stick shaft. Yet another object is to provide a hockey stick with a shaft having these characteristics.

[0009] These and other objects and advantages will become apparent from the foregoing and ongoing written specification, the accompanying drawings and the appended claims.

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Brief Description of the Drawings

[0010] Fig. 1 is a side view of the hockey stick shaft of the present invention.

[0011] Fig. 2 is a front view of the hockey stick shaft of the present invention.

[0012] Fig. 3 is a perspective view of the hockey stick shaft of the present invention.

10 [0013] Fig. 4 is a top, cross-sectional view of the hockey stick shaft of the present invention.

[0014] Fig. 5 is a side view of the hockey stick of the present invention.

[0015] Fig. 6 is a perspective view of the hockey stick of the present invention.

Description of the Preferred Embodiments

15 [0016] At the outset, it should be clearly understood that like reference numerals are intended to identify the same structural elements, parts, portions or surfaces consistently throughout the several drawing figures, as such elements, parts, portions or surfaces may be further described or explained by the entire written specifications, of which this detailed description is an integral part. Unless otherwise indicated, the
20 drawings are intended to be read together with the specification, and are to be considered a portion of the entire written description of this invention. As used in the following description, the terms "horizontal", "vertical", "left", "right", "up", "down" and the like, as well as adjectival and adverbial derivatives thereof (*e.g.*, "horizontally", "rightwardly", "upwardly", "radially", etc.), simply refer to the
25 orientation of the illustrated structure as the particular drawing figure faces the reader. Similarly, the terms "inwardly," "outwardly" and "radially" generally refer to the orientation of a surface relative to its axis of elongation, or axis of rotation, as appropriate.

30 [0017] Referring now to the drawings, the hockey stick shaft 10 of the present invention is illustrated in Fig. No. 1. The hockey stick shaft 10 has a substantially rigid elongated main body portion (11) made from a wide variety of materials such as

polypropylene, polyethylene, vinyl or acrylonitrile butadienestyrene (ABS). In this preferred embodiment, the elongated main body portion is made from polypropylene.

Fig. 1 illustrates two rib portions 12A, 12B which are coextruded relative to the longitudinal axis of the elongated main body portion 11. In this embodiment, the rib portion, and, more particularly, the outer surface of the rib portion, has a coefficient of friction greater than the coefficient of friction of the outer surface of the main body portion 11. The rib position(s) may be made from a wide variety of materials including ethylene vinyl acetate, sanoprene or low-density polyethylene. Sanoprene is used in a preferred embodiment.

10 **[0018]** Fig. 2 is a front view of the hockey stick shaft 10 of the present invention. This view illustrates the outer surface of the main body portion 11 and a side view of two of the four rib portions 12B, 12C in this embodiment. Similarly, Fig. 3 is a perspective view of the hockey stick shaft 10 of the present invention. Each of the four ribbed portions 12A, 12B, 12C, 12D are illustrated in Fig. 3. Fig. 4 is a top,
15 cross-sectional view of the hockey stick shaft which illustrates each of the four ribbed portions 12A, 12B, 12C, 12D and the generally hollow main body portion (11). The cross-section may be, but is not necessarily, rectangular. The sides of the main body position are substantially planar, but, in other embodiments, may be concave or convex.

20 **[0019]** In a preferred embodiment, the main body portion material and the rib portion material are fed simultaneously into an extrusion machine (also referred to as a co-extrusion device or extrusion device), whereupon the extrusion machine coextrudes the main body portion and rib portion(s). The described methods and other methods of co-extrusion are known to those skilled in the art, and variations are
25 contemplated herein. For example, the main body portion 11 may first be extruded through an extrusion machine, and one or more rib portion(s) 12A, 12B, 12C, 12D later extruded on the main body portion. The materials are co-extruded to form a hockey stick shaft having, in one embodiment, four generally parallel rib portions extending parallel to the longitudinal axis of the shaft over the full length of the main
30 body portion. Other embodiments may include rib portions which are not parallel to the longitudinal axis of the main body portion, not parallel to each other, or which do

not extend its full length. Such rib portions may be extruded/formed in any suitable manner. The described methods and other methods of co-extrusion are known to those skilled in the art, and variations are contemplated herein.

[0020] The hockey stick 15 of the present invention is illustrated in Figs. 5 and 6.

5 Fig. 5 is a side view of the hockey stick 15 which illustrates the main body portion 11, two of the four rib portions 12A, 12B, a butt end or handle 13 attached to the proximal end of the main body portion 11, and a blade 14 attached to the distal end of the main body portion 11. The shape of the blade is known to those skilled in the art, and is subject to several variations. Fig. 6 is a perspective view of the hockey stick 15 which
10 illustrates the main body portion 11, handle 13, blade 14 and two rib portions 12C, 12D. The blade in this embodiment is adhered to the main body portion. It may be connected in any desired manner, or may be extruded with the main body portion to form a single piece.

[0021] While there has been described what is believed to be the preferred
15 embodiment of the present invention, those skilled in the art will recognize that other and further changes and modifications may be made thereto without departing from the spirit of the invention. Therefore, the invention is not limited to the specific details and representative embodiments shown and described herein. Accordingly, persons skilled in this art will readily appreciate that various additional changes and
20 modifications may be made without departing from the spirit or scope of the invention, as defined and differentiated by the following claims. In addition, the terminology and phraseology used herein is for purposes of description and should not be regarded as limiting.